



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/761,778	01/18/2001	Yoshinobu Kubota	1460.1016	5961

21171 7590 07/27/2004

STAAS & HALSEY LLP  
SUITE 700  
1201 NEW YORK AVENUE, N.W.  
WASHINGTON, DC 20005

EXAMINER

KAO, CHIH CHENG G

ART UNIT PAPER NUMBER

2882

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/761,778

Applicant(s)

KUBOTA ET AL.

Examiner

Chih-Cheng Glen Kao

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 June 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1, 6, 17, and 18 are objected to because of the following informalities, which appear to be minor draft errors including grammatical problems.

In the following format (location of objection; suggestion for correction), the following suggestions may obviate their respective objections: (claim 1, line 2, “guiding light and having”; inserting a comma before “and”), (claim 6, last line, “transmitted, to a second electrode”; deleting the comma), (claim 17, line 2, “guiding light and having”; inserting a comma before “and”), and (claim 18, line 7, “optical waqveguide”; replacing “waqveguide” with - -waveguide- -).

For purposes of examination, the claims have been treated as such. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 9-12, and 15-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Sano et al. (US Patent 4756587).

Art Unit: 2882

3. Regarding claims 1 and 17, Sano et al. discloses a device comprising a first optical element (Fig. 6(a), #1) on a substrate (Fig. 6(b), #13)) having an optical coupling part (Fig. 6(a), #3), a second optical element (Fig. 6(a), #27) on the substrate guiding light from the optical coupling part of the first optical element, and a third optical element (Fig. 6(a), #5 or 31) on the substrate guiding or protecting light radiated, emitted, or leaking from the optical coupling part.

4. Regarding claims 9, 10, 18, and 19, Sano et al. discloses a device comprising a substrate (Fig. 10, #13) having at least two optical elements (Fig. 10, #44, 35, and 36), a first optical waveguide (Fig. 10, #1) connecting the optical elements, and a pair of second optical waveguides (Fig. 10, #4 and 5) formed on both sides of the first optical waveguide to guide light radiated, leaking, or outputted from the first optical waveguide.

5. Regarding claims 11 and 12, Sano et al. further discloses the third optical element guiding light to an outside of the substrate (Fig. 6(b), #5 or 31), which extends to an outside face of the substrate, to at least one of an upper and lower surface, and releases the light to an exterior at the surface to which the optical element extends (Fig. 6(b), #31).

6. Regarding claims 15 and 16, Sano et al. discloses an apparatus and method comprising a substrate (Fig. 6(b), #13), an optical coupler (Fig. 6(a), #3) formed on the substrate and guiding light from an optical component (Fig. 6(a), #1) on the substrate to another optical component (Fig. 6(a), #27) on the substrate, and an optical element (Fig. 6(a), #5 or 31) on the substrate

Art Unit: 2882

guiding light which is radiated or leaking from the optical coupler to an outside of the substrate (Fig. 6(b), #5 or 31).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US Patent 5117470) in view of Sano et al.

8. Regarding claim 1, Inoue et al. discloses a device comprising: a first optical element (Fig. 32, #61) on a substrate (Fig. 32, #9) having an optical coupling part (Fig. 32, #65a) and a second optical element (Fig. 32, #68a) on the substrate guiding light from the first optical element.

However, Inoue et al. does not disclose a third optical element on the substrate guiding light radiated from the optical coupling part.

Sano et al. teaches a third optical element (Fig. 11, #5) waveguide on the substrate guiding light radiated from the optical coupling part.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the device Inoue et al. with the third optical element of Sano et

Art Unit: 2882

al., since one would be motivated to incorporate it to create low loss and have a favorable wavelength-separation characteristic (col. 1, lines 55-58) as implied from Sano et al.

9. Regarding claim 2, Inoue et al. further discloses at least one optical element as a Mach-Zehnder type optical element (Fig. 32, #70a).

10. Regarding claim 3, Inoue et al. further discloses at least one optical element as a Mach-Zehnder interferometer type optical modulator (Fig. 32, #70a).

11. Regarding claim 4, Inoue et al. further discloses at least two optical elements connected in tandem (Fig. 32, #70a and 70c).

12. Regarding claim 8, Inoue et al. further discloses light from the first optical element formed in a Mach-Zehnder interferometer structure to attenuate light intensity and vary an amount of attenuation (Fig. 32, #70c).

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. in view of Sano et al. as applied to claim 1 above, and further in view of Asano et al. (US Patent 5621839).

Inoue et al. as modified above suggests a device as recited above.

However, Inoue et al. does not disclose a ferroelectric substrate.

Asano et al. teaches a ferroelectric substrate (Title).

Art Unit: 2882

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the device of Inoue et al. as modified above with the ferroelectric substrate of Asano et al., since one would be motivated to incorporate this to build a device in which a light dividing ratio and a light insertion loss are not varied (col. 2, lines 9-16) as shown by Asano et al.

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. in view of Sano et al. as applied to claim 1 above, and further in view of Ooi et al. (US Patent 5917628).

For purposes of being concise, Inoue et al. as modified above suggests a device as recited above.

However, Inoue et al. does not disclose a clock signal voltage to an electrode for varying a refractive index of an optical coupling part and a signal voltage modulated to a second electrode.

Ooi et al. teaches a clock signal voltage to an electrode (Fig. 1, #62 and 70) for varying a refractive index of an optical coupling part (col. 6, lines 5-7) and a signal voltage modulated to a second electrode (Fig. 1, #63 and 70).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the device of Inoue et al. as modified above with the clock and modulated signals of Ooi et al., since one would be motivated to incorporate this to better output a desirable optical signal at all times regardless of variations in accuracy during manufacturing (col. 2, lines 19-23) as implied from Ooi et al.

Art Unit: 2882

15. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. in view of Sano et al. as applied to claim 1 above, and further in view of Hosoi (US Patent 5475771).

Inoue et al. as modified above suggests a device as recited above.

However, Inoue et al. does not disclose a lithium niobate substrate.

Hosoi teaches a lithium niobate substrate (col. 1, lines 11-15).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the device of Inoue et al. as modified above with the substrate of Hosoi, since one would be motivated to incorporate this to create a larger electromechanical coupling coefficient (col. 1, lines 11-15) as shown by Hosoi.

16. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sano et al. as applied to claim 12 above, and further in view of Jestel et al. (US Patent 5396328).

Sano et al. discloses a device as recited above.

However, Sano et al. does not disclose mirrors or a diffraction grating at the end.

Jestel et al. teaches mirrors (Fig. 1, #15-17) or a diffraction grating (col. 7, lines 4-12, and Fig. 6, #55) at the end.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the device of Sano et al. with the mirrors or diffraction gratings of Jestel et al., since one would be motivated to incorporate them for guiding light to a different location (col. 1, lines 10-20) as implied from Jestel et al.



***Response to Arguments***

17. Claim objections and rejections under 35 U.S.C. 112, first paragraph, in the Office Action mailed 2/19/2004 have been withdrawn in light of the Amendment made of record on 6/18/2004.

18. Applicant's arguments with respect to claims 17-19 have been considered but are moot in view of the new ground(s) of rejection.

19. Applicant's arguments filed 6/18/2004 have been fully considered but they are not persuasive.

Regarding Sano et al., Applicant argues that Sano et al. does not meet all of the features of at least independent claims 1, 9, 10, 15, and 16. Applicant also argues that Sano et al. does not teach or suggest a third optical element for at least the same reasons in claims 1-4, 5-8, 13, and 14. The Examiner disagrees based on the filters of Sano et al. as pointed out by Applicant, which act as optical elements or waveguides that guide or protect light radiated or leaked from an optical coupling part or another waveguide as noted above. Thus, Sano et al. meets all the features of at least independent claims 1, 9, 10, 15, and 16 as well as make obvious claims 1-4, 5-8, 13, and 14 in combination with other prior art.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).


Art Unit: 2882

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gk



EDWARD J. GLICK  
SUPERVISORY PATENT EXAMINER